BIOSOLIDS EMS MANUAL
ELEMENT 5.0 – APPENDIX 5A
BIOSOLIDS GOALS AND OBJECTIVES SUMMARY

FORT WORTH WATER

GOAL: Increase digested feed sludge to 5%

Objective: Increase digested feed sludge by 5%

ACTION PLAN: VCWRF Thickener Process Study	RESPONSIBLE PARTY	MILESTONE COMPLETION DATE	STATUS	KEY OUTCOMES
1. Hire Consultant For Design Work	Ana Pen - Engineering Manager	June 15, 2015	Complete (June 15, 2015)	• Environmental Performance • Improve Biosolids Management Practices
2. Finalize Scope of Work	Ana Pen - Engineering Manager	July 15, 2015	Complete (July 15, 2015)	
3. Finish Conceptual design	Ana Pena-Engineering Manager	July 31, 2016	Not complete	
4. Final design phase	Ana Pena-Engineering Manager	February 28, 2017	Not complete	
5. Begin construction	Ana Pena-Engineering Manager	July 31, 2017	Not complete	

Notes/Comments:

- The purpose is to look into a new thickening technology that will replace the DAFTs.
- March 2016: No changes.
- **June 2016:** Conceptual design date moved forward as it has not been completed.

GOAL: Increase thickened sludge percent solids by least 1% for 90% of the time during a given month

Objective: Increase thickened sludge percent solids by least 1.0% for 90% of the time during a given month

ACTION PLAN: Install 3rd GBT unit to increase solids stability	RESPONSIBLE PARTY	MILESTONE COMPLETION DATE	STATUS	KEY OUTCOMES
1. Conceptual Design	Ana Pena-Engineering Manager	December 2012	Complete (December 2012)	• Environmental Performance • Regulatory Compliance • Improve Biosolids Management Practices
2. Final Design	Ana Pena-Engineering Manager	May 2013	Complete (May 2013)	
3. Begin construction	Ana Pena-Engineering Manager	November 20, 2012	Complete (November 20, 2012)	
4. Substantial construction completion	Ana Pena-Engineering Manager	October 31, 2015	Complete (October 31, 2015)	
5. Evaluate effectiveness of additional GBT unit on solids stability.	Ana Pena-Engineering Manager	July 31, 2016	Complete (July 15, 2016)	

Notes/Comments:

- It is expected by May of 2015 that there will be sufficient data to be able to determine if digested sludge percent solids have increased.
- Data from 2012/2013 (pre-GBTs) will be examined in conjunction with data collected after the third GBT is installed in order to determine effectiveness.
- Progress for this goal has been delayed due to troubleshooting the thickening pumps and solving electrical problems.
- December 2015: Due to operational issues experienced in November, the evaluation has been pushed back through February in order to collect better data.
- March 2016: After analyzing data for percent solids feeding into the blend tank, it was determined that this was not the best data point from which to determine whether digested sludge percent solids have increased due to the addition of a third GBT. The completion date is being moved to April 30, 2016 in order to acquire waste activated sludge data and reanalyze for an increase attributable to GBT operation.
- **July 2016**: After discussing goal, it was determined that it was not stated correctly when the goal was created and the goals verbiage was changed from "Increase digested sludge percent solids to at least 2.5% for 90% of the time during a given month' to 'Increase thickened sludge percent solids by least 1.0% for 90% of the time during a given month." Having 3 GBTs has allowed WAS to be processed by GBTs instead of only the DAFTs and because of this, the thickened sludge has increased about 1%, although not necessarily for 90% of the time for a given month. Additional notes available upon request.

BIOSOLIDS EMS MANUAL
ELEMENT 5.0 – APPENDIX 5A
BIOSOLIDS GOALS AND OBJECTIVES SUMMARY

GOAL: Increase percent solids of biosolids (prior to lime addition) by 3%				
Objective: Increase percent solids of biosolids (prior to lime addition) by 3%				
ACTION PLAN: **Dewatering Facility Upgrades**	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	**KEY OUTCOMES**
1. Hire consultant	Steven L. Nutter-Biosolids EMS Manager	April 18, 2014	Complete (April 18, 2014)	• Environmental Performance • Regulatory Compliance • Improve Biosolids Management Practices
2. Electrical System Evaluation	Steven L. Nutter-Biosolids EMS Manager	July 11, 2014	Complete (August 27, 2014)	
3. Final Design	Steven L. Nutter-Biosolids EMS Manager	September 30, 2014	Complete (August 29, 2014)	
4. Funding approved by City Council	Steven L. Nutter-Biosolids EMS Manager	October 16, 2015	Complete (October 16, 2015)	
5. Start construction on 6th belt press, polymer, and lime systems.	Steven L. Nutter-Biosolids EMS Manager	August 1, 2016	Complete (May 2, 2016)	
6. Finish construction of 6th belt press, new polymer and lime systems.	Steven L. Nutter-Biosolids EMS Manager	January 1, 2017	Not complete	
ACTION PLAN: COMPLETED **Increase dewaterablity at the belt presses**	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	
1. Corroborate presence of struvite (collect samples)	Steven L. Nutter-Biosolids EMS Manager Ana Pena-Engineering Manager	July 7, 2014	Complete (July 7, 2014)	
2. Install ferric sulfate addition station	Steven L. Nutter-Biosolids EMS Manager Ana Pena-Engineering Manager	August 18, 2014	Complete (August 18, 2014)	
3. Install ferric chloride addition station*	Steven L. Nutter-Biosolids EMS Manager Ana Pena-Engineering Manager	November 25, 2014	Complete (November 24, 2014)	
4. Installation of Total Solids and Total Suspended Solids meters	Steven L. Nutter-Biosolids EMS Manager Ana Pena-Engineering Manager	April 30, 2015	Complete (April 30, 2015)	
5. Optimize dosage of ferric chloride	Steven L. Nutter-Biosolids EMS Manager Ana Pena-Engineering Manager	June 1, 2016	Complete (June 10, 2016)	

Notes/Comments:

- After ferric sulfate was added, it was determined that the dosage and the chemical itself were not as effective as needed. Therefore a switch was made to ferric chloride, which resulted in a different feed station being built to accommodate the volume necessary to achieve an effective dosage. The addition of ferric chloride should result in the added benefits of minimizing struvite buildup at the dewatering facility and reducing odors.
- Dosage optimization was supposed to be complete by May, but because the HRC was in use (which adds Ferric sulfate), an increase in percent solids could not be attributed to the ferric chloride alone therefore the milestone complete date was changed.
- The TSS meter was relocated in August 2015. As of September 2015, the ferric chloride contract is being extended through the end of the year. Ferric Chloride dose optimization is still being determined.
- As of December 2015, the ferric chloride contract has been extended through the end of January.
- March 2016: Ferric chloride has not been optimized yet due to the fact that VCWRF operations are getting ready to start feeding ferric sulfate in the primaries. This will alter the post digestion treatment with ferric chloride.
- **June 2016:** During the spring of 2016 ferric sulfate was fed into primary clarifiers 1-6. During this time period VC personnel were collecting data to evaluate effectiveness of the chemical treatment activities. On June 10th, 2016 Tech Services presented the data to senior management at VC. Based on this information the decision was made to perform post digestion treatment with ferric chloride at a concentration of 2 gallons ferric chloride per 1,000 gallons of liquid sludge. If ferric sulfate treatment in the primary area is expanded or reduced then post digestion treatment activities will be reevaluated.

BIOSOLIDS EMS MANUAL
ELEMENT 5.0 – APPENDIX 5A
BIOSOLIDS GOALS AND OBJECTIVES SUMMARY

GOAL: Increase biosolids production and storage capacity by 100%				
Objective: ***Increase biosolids production and storage capacity by 100%***				
ACTION PLAN: **Belt Press Facility Expansion**	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	**KEY OUTCOMES**
1. Hire Consultant for Design Work	Steven L. Nutter-Biosolids EMS Manager Ana Pena-Engineering Manager	May 20, 2015	Complete (May 20, 2015)	• Environmental Performance • Improve Biosolids Management Practices
2. Finalize Scope of Work	Steven L. Nutter-Biosolids EMS Manager Ana Pena-Engineering Manager	February 29, 2016	Complete (November 24, 2015)	
3. City Council Approval	Steven L. Nutter-Biosolids EMS Manager Ana Pena-Engineering Manager	May 31, 2016	Complete (June 7, 2016)	
4. Finish Conceptual design	Steven L. Nutter-Biosolids EMS Manager Ana Pena-Engineering Manager	September 31, 2016	Not complete	
5. Final design phase	Steven L. Nutter-Biosolids EMS Manager Ana Pena-Engineering Manager	April 30, 2017	Not complete	
6. Begin construction	Steven L. Nutter-Biosolids EMS Manager Ana Pena-Engineering Manager	August 31, 2017	Not complete	
7. Finish construction	Steven L. Nutter-Biosolids EMS Manager Ana Pena-Engineering Manager	May 30, 2018	Not Complete	
ACTION PLAN: **Install liquid sludge storage tanks**	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	
1. Hire Consultant for Design Work	Steven L. Nutter-Biosolids EMS Manager	April 20, 2015	Complete (April 20, 2015)	
2. Finalize Scope of Work	Steven L. Nutter-Biosolids EMS Manager	July 10, 2015	Complete (July 10, 2015)	
3. City Council Approval	Steven L. Nutter-Biosolids EMS Manager	March 31, 2016	Completed (March 29, 2016)	
4. Finish Conceptual design	Steven L. Nutter-Biosolids EMS Manager	July 31, 2016	Not complete	
5. Final design phase	Steven L. Nutter-Biosolids EMS Manager	October 31, 2016	Not complete	
6. Begin construction	Steven L. Nutter-Biosolids EMS Manager	April 30, 2017	Not complete	
7. Finish construction	Steven L. Nutter-Biosolids EMS Manager	October 31, 2017	Not complete	
Notes/Comments: • March 2016: Completion dates have been moved forward. • **June 2016:** The sixth belt press has been put in place, but is not fully installed/online.				

BIOSOLIDS EMS MANUAL
ELEMENT 5.0 – APPENDIX 5A
BIOSOLIDS GOALS AND OBJECTIVES SUMMARY

GOAL: Identify four public concerns regarding biosolids				
Objective: ***Identify four public concerns regarding biosolids***				
ACTION PLAN: A Determine concerns based on feedback received from interested parties.	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	**KEY OUTCOMES**
1. Identify four (4) public/third party concerns	VCWRF Biosolids personnel	September 15, 2015	Complete (September 23, 2015)	• Improve Public Relations
Concern #1= "The City of Fort Worth biosolids webpages are out of date." *Concern #2= "The EPA and TCEQ standards are not strict enough."* Concern #3= "Too much about biosolids are unknown." Concern #4= "Are there pharmaceuticals and personal care products (PPCPs) in biosolids?"				
2. For each concern, either contact three (3) interested parties or conduct presentation with one (1) interested party*	VCWRF Biosolids personnel	January 31, 2016	**Concern #1 -**Complete (January 13, 2016) **Concern #2** -Not complete **Concern #3-**Complete (November 10, 2015) **Concern #4-**Complete (November 10, 2015)	
ACTION PLAN: B Improve ability to identify concerns via ~~mail outs~~ FAQs placed in information tubes at land application sites	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	
1. Contact the communication and outreach division to determine if mail outs (surveys, fact sheets, etc.) are feasible	VCWRF Biosolids personnel	July 31, 2015	Complete (June 12, 2015)	
2. Determine if GIS department can acquire mailing addresses for residents around land sites	VCWRF Biosolids personnel	August 7, 2015	Complete (September 14, 2015)	
3. Develop information FAQ to be mailed to interested parties	VCWRF Biosolids personnel	October 15, 2015	Complete (December 21, 2015)	
4. Determine if addresses can be purchased to mail out FAQ	VCWRF Biosolids personnel	October 31, 2015	Complete (December 21, 2015)	
5. Determine if FAQ can be mailed to addresses surrounding land application sites	VCWRF Biosolids personnel	October 31, 2015	Complete (December 21, 2015)	
6. Begin placing FAQ in information tubes attached to site notification signs at land application site entrances	VCWRF Biosolids personnel	March 25, 2016	Complete (March 25, 2016)	
7. Evaluate the effectiveness of the information tubes by tracking the amount of FAQ taken	VCWRF Biosolids personnel	November 30, 2016	Not complete	
ACTION PLAN: C Improve ability to identify concerns using the Water Department's social media accounts	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	
1. Contact the Communication and Outreach division to determine what content can be posted to the Water Department's social media accounts (Facebook & Twitter)	VCWRF Biosolids personnel	July 31, 2015	Complete (June 12, 2015)	
2. Begin posting biosolids information to Water Department's Facebook account	VCWRF Biosolids personnel	January 31, 2017	Not complete	

BIOSOLIDS EMS MANUAL
ELEMENT 5.0 – APPENDIX 5A
BIOSOLIDS GOALS AND OBJECTIVES SUMMARY

ACTION PLAN: D Improve ability to address public concerns by updating Biosolids webpage	RESPONSIBLE PARTY	MILESTONE COMPLETION DATE	STATUS	
1a. Update grammar and typographical errors	VCWRF Biosolids personnel	August 31, 2015	Complete (August 17, 2015)	• Improve Public Relations
1b. Remove outdated information	VCWRF Biosolids personnel	August 31, 2015	Complete (September 17, 2015)	
1c. Update tables on webpages	VCWRF Biosolids personnel	August 31, 2015	Complete (January 13, 2016)	
2a. Add additional webpage for biosolids brochure	VCWRF Biosolids personnel	January 31, 2017	Not complete	
2b. Add additional webpage for FAQ (developed from 2nd action plan above)	VCWRF Biosolids personnel	January 31, 2017	Not complete	
2c. Add additional webpage for facts not listed in the FAQ	VCWRF Biosolids personnel	January 31, 2017	Not complete	
ACTION PLAN: E -Completed Improve ability to address or identify concerns via tour survey	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	**KEY OUTCOMES**
1. Develop survey to gage the public's general knowledge/feelings about biosolids	VCWRF Biosolids personnel	December 31, 2015	Complete (October 29, 2015)	• Improve Public Relations
2. Preliminary implementation of survey to determine what metrics can be obtained and used for quantifying public outreach responses	VCWRF Biosolids personnel	December 31, 2015	Complete (November 15, 2015)	
3. Begin using survey on a regular basis during tours when possible	VCWRF Biosolids personnel	December 31, 2015	Complete (November 15, 2015)	
4. Evaluate metrics and plot data to determine effectiveness of survey and tour presentations	VCWRF Biosolids personnel	July 31, 2016	Complete (July 13, 2016)	

Notes/Comments:

- *Contact may involve providing literature or documentation regarding the City's biosolids program or inviting interested parties for tours of the Village Creek Water Reclamation Facility and Dewatering Facility.
- Additional steps may be added to the action plans once feasibility of the outreach activity has been determined.

Action Plan A

- The FAQ addresses Concerns #1 and # 3 and will be available to the public via tours or information tubes attached to land application signs at site entrances.
- March 2016: Concern #1 has been completed but the date is not known. When details can be acquired, the date will be inserted.
- **July 2016:** Concern #2 will be addressed in a presentation to be developed by the end of 2016 that will be specific to the biosolids program that can be used for special tour groups or interested parties. Concern #4 was addressed in a brochure that was completed in November, but not printed until April 2016.

Action Plan B

- The GIS department was contacted on August 7th regarding whether they were able to gather mailing addresses for residents surrounding land application sites. On September 14, 2015 the GIS department notified biosolids personnel that they were unable to acquire the addresses.
- On December 21, 2015, it was determined that mailing fact sheets is not a viable option for the biosolids program. Instead, fact sheets will be placed in an information tube and attached to the site notification signs located at site entrances. Placing a certain amount of fact sheets in the tubes and counting them during inspections will allow us to keep track of how many are taken introducing a potential metric with which to measure this outreach effort.
- March 2016: Information tubes were attached to site notification signs on 03-25-16 and a certain number of ~~factsheets~~ Frequently Asked Questions were placed inside. This information will be tracked to determine how effective the Information tubes are. Two more steps were added to reflect the change to this action plan.
- **July 2016:** Since Infotubes with FAQs have been posted on land application signs; approximately 34% of them have been taken. Sign/Infotube visibility, site entrance location, and number of FAQ taken per person are all variables that can affect the percent of FAQ taken at land application sites. Data collection for FAQs will be ongoing even after the action plan is completed.

Action Plan C

- When lime is removed and it can be confirmed that the biosolids odors have improved for the long term, information will begin being posted to the Water Department's Facebook page (where application is occurring, general information about the biosolids program, etc.)
- March 2016: Completion date has been moved forward for social media postings.
- **July 2016:** Currently waiting for Chlorine dioxide to be approved for long-term biosolids treatment before posting information to social media regarding biosolids program and biosolids quality.

Action Plan D

- Due to changes to the City's website policies the Water Department's Communication and Outreach division informed biosolids personnel that posting PDF documents to the City's webpages should be avoided as much as possible to comply with the Americans with Disabilities Act (ADA) requirements. Therefore, new information will be added as additional webpages if possible. See Action Plan: Add additional biosolids webpages.
  March 2016: Completion dates have been moved forward due to complications in posting information to the City's website. Step 1c has been completed but the date is not known. When details can be acquired, the date will be inserted.
  July 2016: Reference material that was used to develop facts not listed in the FAQ is being acquired to be made available to the public when new biosolids webpages can be posted.

Action Plan E

- It is anticipated that possible metrics stemming from the responses gathered from the survey will include: how familiar people are with the term "biosolids,' what people's general attitude is towards biosolids, and if their general attitude changes after seeing a presentation on wastewater treatment and biosolids.
- March 2016: The completion date has been moved forward in order to accumulate more tour data.
- **July 2016:** Since surveys began being distributed during Village Creek tours in November, 103 comments have been elicited from tour participants. Past tours that did not include a biosolids survey, rarely garnered any feedback about biosolids. Surveys have been an effective tool at eliciting comments and questions and different metrics have been gathered based on the survey responses. This action plan is complete, but tour data will continue to be collected. Additional notes available upon request.

GOAL: ***Reduce the amount of lime (tons) used per month by 50%***

Objective: ***Reduce the amount of lime (tons) used per month by 50%***

ACTION PLAN: **Add chlorine dioxide to biosolids to meet pathogen requirements**	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	**KEY OUTCOMES**
1. Obtain approval for pilot project	Steven L. Nutter-Biosolids EMS Manager	December 31, 2015	Complete (December 1, 2015)	• Environmental Performance • Improve Biosolids Management Practices
2. Begin pilot project	Steven L. Nutter-Biosolids EMS Manager	March 1, 2016	Complete (March 15, 2016)	
3. Conduct pathogen sampling	Steven L. Nutter-Biosolids EMS Manager	May 1, 2016	Complete (May 10, 2016)	
4. Evaluate effectiveness	Steven L. Nutter-Biosolids EMS Manager	June 1, 2016	Complete (June 16, 2016)	
5. Award contract for long term usage	Steven L. Nutter-Biosolids EMS Manager	December 31, 2016	Not complete	
6. Determine whether lime usage has decreased after ClO2 has been online	Steven L. Nutter-Biosolids EMS Manager	April 30, 2017	Not complete	

Notes/Comments:

- **July 2016:** In order to reduce odors, which are primarily caused by lime, Chlorine dioxide was found to be a feasible option for improving biosolids quality. Chlorine dioxide can also be utilized for pathogen reduction, which would allow for a reduction in lime usage. Currently, the City is waiting for a long term contract to be put in place in order to feed chlorine dioxide to SOL storage tank #1. Chlorine dioxide was found to be most effective at eliminating pathogens and reducing odors at 100ppm.

BIOSOLIDS EMS MANUAL
ELEMENT 5.0 – APPENDIX 5A
COMPLETED BIOSOLIDS GOALS

FORT WORTH® WATER

GOAL: Increase TSS Removal in Primaries up to 80%

Objective: Increase TSS Removal in Primaries by 80%

ACTION PLAN: COMPLETED Increase settling in primary clarifiers	RESPONSIBLE PARTY	MILESTONE COMPLETION DATE	STATUS	KEY OUTCOMES
1. CEPT study via jar testing	Ana Pena-Engineering Manager	December 5, 2014	Complete (December 5, 2014)	• Environmental Performance • Improve Biosolids Management Practices
2. Evaluate and review draft CEPT study report	Ana Pena-Engineering Manager	April 21, 2015	Complete (April 21, 2015)	
~~3. Get chemical contracts in place~~	~~Ana Pena-Engineering Manager~~	~~January 31, 2015~~	~~Not complete~~	
4. Final CEPT Report Received.	Ana Pena-Engineering Manager	October 27, 2015	Complete (October 27, 2015)	

Notes/Comments:

- CEPT=Chemically Enhanced Primary Treatment
- The CEPT study was an initial step in looking at the primaries as a whole and what could be done to improve them. While the CEPT study was helpful in regards to pushing chemical contracts through City council, there were many other projects
- December 2015: The CEPT study was an initial pilot to determine what needs to be done to the smaller primaries (whether to introduce a new technology or rehabilitate them). There will be additional projects in the future looking at the primaries, but details on what is to occur is very limited and timelines are unknown. The chemical contracts are actually plant wide contracts that involve chemicals for many different processes and not primary specific. The initial idea was that the chemical contracts would include a potential chemical that would have been fed into the primaries as part of the overall goal. Therefore, this step in the action plan was eliminated. It is unknown at this time what chemicals would be introduced to help primary TSS removal. It was decided to close this goal as further details about the projects involving primaries are either unknown at this time or not in the planning stages.

GOAL: Reduce Odor Complaints from Reporting Year 2013-2014 by 50% (46 complaints/year to 23 complaints)*

Objective: Reduce Odor Complaints from reporting year 2013-2014 by 50% (46 complaints to 23 complaints)

ACTION PLAN: COMPLETED Biosolids Master Plan	RESPONSIBLE PARTY	MILESTONE COMPLETION DATE	STATUS	KEY OUTCOMES
1. Award contract for project	Steven L. Nutter-Biosolids EMS Manager	April 30, 2012	Complete	• Environmental Performance Regulatory Compliance • Improve Biosolids Management Practices • Improve Public Relations
2. Workshop 1 (Kickoff)	Steven L. Nutter-Biosolids EMS Manager	June 7, 2013	Complete	
3. Submit formal data request	Steven L. Nutter-Biosolids EMS Manager	June 21, 2013	Complete	
4. TMs 1 and 2 Draft (Regulatory & Data)	Steven L. Nutter-Biosolids EMS Manager	July 26, 2013	Complete (September 24, 2013)	
5. Workshop 2 (Criteria & Long List Selection)	Steven L. Nutter-Biosolids EMS Manager	August 26, 2013	Complete (September 25, 2013)	
6. TM 3 Draft Model and short-term)	Steven L. Nutter-Biosolids EMS Manager	September 23, 2013	Complete (October 22, 2013)	
7. Workshop 3 (Screen Alternatives)	Steven L. Nutter-Biosolids EMS Manager	November 19, 2013	Complete (September 26, 2013)	
8. TM 4 Draft (Market Analysis)	Steven L. Nutter-Biosolids EMS Manager	December 20, 2013	Complete (November 18, 2013)	
9. TM 5 Draft (Detailed Analysis)	Steven L. Nutter-Biosolids EMS Manager	January 7 & 8, 2014	Complete (January 7&8 2014)	
10. Workshop 4 (Detailed Analysis)	Steven L. Nutter-Biosolids EMS Manager	March 17, 2014	Complete (March 17, 2014)	
11. TM 6 Draft (Long Term Plan)	Steven L. Nutter-Biosolids EMS Manager	March 28, 2014	Complete (March 14, 2014)	
12. Workshop 5 (Long Term Plan)	Steven L. Nutter-Biosolids EMS Manager	April 14, 2014	Complete (March 17, 2014)	
13. Draft Master Plan Report	Steven L. Nutter-Biosolids EMS Manager	June 9, 2014	Complete (July 18, 2014)	
~~14. Final Master Plan Report~~	~~Steven L. Nutter-Biosolids EMS Manager~~	~~January 31, 2015~~	~~Not Complete~~	

15. Contract Review Workshop	Steven L. Nutter-Biosolids EMS Manager	March 14, 2014	Complete (October 1, 2014)
16. Draft Contract Finalized	Steven L. Nutter-Biosolids EMS Manager	April 30, 2015	Complete (April 30, 2015)
17. Finalize Master Plan and Evaluate	Steven L. Nutter-Biosolids EMS Manager	February 1, 2016	Complete (March 29, 2015)
~~18. Develop action plan~~	~~Steven L. Nutter-Biosolids EMS Manager~~	~~June 1, 2016~~	~~Not Complete~~
ACTION PLAN: COMPLETED Arcadis Biosolids Study-Evaluate Solids Production at Village Creek and SOL	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**
1. Arcadis hired to perform study	Steven L. Nutter-Biosolids EMS Manager	April 2, 2014	Complete (2 April 2014)
2. Arcadis performs site visits of Fort Worth Facilities	Steven L. Nutter-Biosolids EMS Manager	May 1, 2014	Complete (1 May 2014)
3. Data acquisition begins-creation of Arcadis server for uploading files	Steven L. Nutter-Biosolids EMS Manager	May 6, 2014	Complete (6 May 2014)
4. Arcadis performs site visit and review of the dewatering facility	Steven L. Nutter-Biosolids EMS Manager	May 28, 2014	Complete (28 May 2014)
5. Arcadis submits technical memo on dewatering facility site visit	Steven L. Nutter-Biosolids EMS Manager	June 19, 2014	Complete (19 June 2014)
6. Biosolids odor sampling	Steven L. Nutter-Biosolids EMS Manager	June 24-25, 2014 July 23-24, 2014	Complete (June 24-25, 2014) (July 23-24, 2014)
7. Draft Report Issued	Steven L. Nutter-Biosolids EMS Manager	November 1, 2014	Complete (September 16, 2014)
8. Arcadis submits technical memo on impact of process operations at WTPs and VCWRF on odor generation	Steven L. Nutter-Biosolids EMS Manager	November 6, 2014	Complete (November 6, 2014)
The technical memo issued in November will act as Arcadis' final report. The technical memo included suggestions for VCWRF to consider in regards to mitigating odors.			
ACTION PLAN: COMPLETED Study to Evaluate Biosolids Odors Associated with High Strength Wastes, Polymer, Lime Addition (Perkins Study)	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**
1. Hire consultant	Steven L. Nutter-Biosolids EMS Manager	July 5, 2013	Complete
2. Consultant-Develop scope of work and sampling plan	Steven L. Nutter-Biosolids EMS Manager Perkins Engineering Consultants, Inc.	July 31, 2013	Complete (July 30, 2013)
3.a Perform sampling and analysis to evaluate odors associated with lime addition	Village Creek Personnel & Perkins Engineering Consultants, Inc.	October 31, 2013	Complete (October 21, 2013)
3.b Perform sampling and analysis to evaluate odors associated with high strength wastes	Village Creek Personnel & Perkins Engineering Consultants, Inc.	October 31, 2013	Complete (October 14, 2013)
3.c Perform sampling and analysis to evaluate odors associated with polymers	Village Creek Personnel & Perkins Engineering Consultants, Inc.	November 18, 2013	Complete (November 18, 2013)
3.d Perform sampling and analysis to evaluate odors associated with lime dosage	Village Creek Personnel & Perkins Engineering Consultants, Inc.	December 10, 2013	Complete (December 10, 2013)
4. Consultant-Produce Technical report summarizing issues found during study	Perkins Engineering Consultants, Inc.	June 30, 2014	Complete (June 30, 2014)
5. Evaluate report & develop action plan	Steven L. Nutter-Biosolids EMS Manager	July 31, 2014	Complete (June 30, 2014)
The Perkins technical report shows conclusively that lime has a profound impact on odor generation. As such a new Goal &Objective has been developed for determining the feasibility of eliminating lime from the process (i.e. switching from vector attraction reduction alternative #6 to alternative #1)			

BIOSOLIDS EMS MANUAL
ELEMENT 5.0 – APPENDIX 5A
COMPLETED BIOSOLIDS GOALS

Notes/Comments:

- *Complaint count is from biosolids land application activities only.*
- This goal was added in response to public feedback regarding the consistency of the biosolids product- See Public Outreach Evaluation Form from November 8, 2013.
- This Arcadis study is a comprehensive study analyzing the activities at the water treatment plants, Village Creek Water Reclamation Facility, and the dewatering facility at the Sludge Only Landfill and their effect on the overall quality of the biosolids material and its odors.
- **March 2016: This goal is being closed because the Master Plan is complete and Water Engineering is not going to formally finalize the document. While there will be no formal action plan, Village Creek and Water Engineering have settled on the following projects moving forward:**
  - **Increase and improve liquid storage at the Sludge Only Landfill (currently under GOAL: Increase biosolids production and storage capacity by 100%)**
  - **Dewatering facility expansion (current under GOAL: Increase biosolids production and storage capacity by 100%)**
  - **Evaluation of dryers as a long-term option.**
  - **The number of odor complaints for 2014-2015 was 38. For the months of April, May and June 2015, no material was land applied due to the amount of complaints received and the quality of the biosolids. Ferric Chloride has since been integral in improving dewaterablity and odors. As of 3-31-16, there have been 8 odor complaints for the 2015-2016 sludge year which ends in July 2016. The number of complaints was not reduced by 50% for the 2014-2015 sludge year, but the 2015-2016 sludge year appears to be trending towards an overall decrease in complaints.**

GOAL: Increase grit collected and removed by 10,500 lbs./day

Objective: Increase grit collected and removed by 10,500 lbs./day

ACTION PLAN: COMPLETED Install Grit Removal System	RESPONSIBLE PARTY	MILESTONE COMPLETION DATE	STATUS	KEY OUTCOMES
1. Quantify grit removal by classifiers	Ana Pena-Engineering Manager	June 30, 2014	Complete (March 13, 2014) (May 27, 2014) (June 9, 2014)	• Environmental Performance • Regulatory Compliance • Improve Biosolids Management Practices
2. Install grit removal alternative (grit dewatering and storage)	Ana Pena-Engineering Manager	July 16, 2014	Complete (September 12, 2014)	
3. Collect grit sample to verify compliance with landfill disposal requirements	Ana Pena-Engineering Manager	July 16, 2014	Complete (July 16, 2014)	
4. Installation of grit washer	Ana Pena-Engineering Manager	September 15, 2014	Complete (September 15, 2014)	
5. Begin hauling grit to landfill.	Ana Pena-Engineering Manager	August 1, 2014	Complete (September 19, 2014)	
6. One month trial period to evaluate effectiveness	Ana Pena-Engineering Manager	August 19, 2014	Complete (September 19, 2014)	
7. Troubleshoot system and make modifications	Ana Pena-Engineering Manager	December 31, 2015	Complete (December 22, 2015)	
8. Monitor grit production	Ana Pena-Engineering Manager	April 15, 2016	Complete (April 5, 2016)	

Notes/Comments:

- An initial trial of the grit removal system occurred on 6-16-14 and continued overnight. The initial grit removed on 6-16-14 was collected as well as another sample collected on the morning of 6-17-14. They were submitted together as one sample for a paint filter test and TCLP. The grit removal system incurred some issues after it ran overnight. The dates for objectives 2 and 3 were modified to reflect when the grit removal system would be ready again.
- In October, the grit classifiers were modified with sprayers, but the prewashed product did not pass the paint test necessary for landfill disposal. Additional parts and equipment are needed to make modifications on the corkscrew mechanism for the grit disposal apparatus.
- From November 2014 to January 2015, grit was going to either Renda or the landfill.
- From Mid-February 2015 to March 2015, grit was being disposed of to the landfill.
- Troubleshooting/modifications will occur concurrently with monitoring as the grit will still go to the roll off dumpsters.
- Troubleshooting/modifications continue as of the September 2015 update.
- From January 1, 2016-March 31, 2016 grit collection will be monitored to better determine how much and how often is it being collected.
- March 2016: This goal's completion date is being extended to April 15, 2016 in order to accommodate the acquisition of March 31st data, which is not available until April 1st, and to analyze the amount of grit collected against rainfall data.
- **June 2016: The average amount of grit collected and removed per day is 52,680 pounds. Notes explaining calculations available upon request.**

BIOSOLIDS EMS MANUAL
ELEMENT 5.0 – APPENDIX 5A
COMPLETED BIOSOLIDS GOALS

GOAL: Increase gas production by at least 5% during the scum addition interval*				
*Objective: Increase gas production by at least 5% during the scum addition interval**				
ACTION PLAN: COMPLETED Utilize Scum Screenings as Organic Source for Co-Digestion	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	**KEY OUTCOMES**
1. Kick-off/Chartering Meeting	Ana Pena-Engineering Manager	March 5, 2014	Complete (March 5, 2014)	• Environmental Performance • Regulatory Compliance • Improve Biosolids Management Practices
2. Submit Preliminary Design	Ana Pena-Engineering Manager	April 17, 2014	Complete (April 17,2014)	
3. Preliminary Design Review Meeting	Ana Pena-Engineering Manager	May 2, 2014	Complete (May 2, 2014)	
4. Final Design Review Meeting	Ana Pena-Engineering Manager	June 17, 2014	Complete (May 22, 2014)	
5. Deliver Construction Documents	Ana Pena-Engineering Manager	July 2, 2014	Complete (June 2, 2014)	
6. Begin construction	Ana Pena-Engineering Manager	July 2, 2014	Complete (July 2, 2014)	
7. Complete construction	Ana Pena-Engineering Manager	April 30, 2015	Complete (April 30, 2015)	
8. Determine amount of gas production attributable to the addition of the scum screenings at the end of 3 months.	Ana Pena-Engineering Manager	June 13, 2016	Complete	

Notes/Comments:

- How long the scum system will be running when it's in operation has yet to be determined. Because the scum system may run intermittently or as necessary, the goal is to see an increase in gas production for all digesters ~~digesters 9-14~~ when the scum system is running. The co-digestion feed will have to be taken out of account when determining what effect the scum system *alone* has on gas production.
- System was down for the month of May.
- Operational issues involving tanks, pumps, screens and power have delayed progress on this goal since the June 2015 update. An SOP is still being modified and it is believed by October 2015, most of the operational issues will be fixed. October-December will mark the 3 month period mentioned in step 8 above whereby the total gas produced from all digesters will be quantified and compared to data from before the scum screen was added.
- Due to excessive rain and the steam turbines being offline for a period of time, there were too many variables that may have affected how much gas was produced. Therefore, completion date for the determination of gas production attributable to scum screenings has been changed to March 31, 2016.
- March 2016: After digester gas production data was analyzed to determine if scum was having any effect on gas production, it was determined that different data would need to be analyzed in order to better determine if scum addition is causing an increase in gas production. Therefore, the completion date has been moved to April 30, 2016 in order to gather the necessary data.
- **June 2016: Because scum is pumped to the high strength waste mix tank at the co-digestion station, it cannot be determined whether scum screenings cause an increase in gas production. Scum pumped to the mix tank of the co-digestion station is not metered, is pumped with varying amounts of water depending on the consistency of the scum, and is roughly only 10-15% of the total contents of the mix tank. Additional notes available upon request.**